

Laparoscopic Nephropexy with Polymer Clips

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ABSTRACT

Background and Objectives: We present our initial experience and long-term results with transperitoneal laparoscopic nephropexy with nonabsorbable polymer clips.

Methods: Seven patients aged 34 to 47 years previously diagnosed with mobile kidney presented with chronic pain refractory to analgesics and underwent a transperitoneal laparoscopic nephropexy procedure with nonabsorbable polymer clips by fixing the perirenal tissue to the transversus abdominis fascia and triangular ligament.

Results: Mean operation time was 20 minutes. All patients were discharged after 24 hours. Follow-up intravenous pyelogram (IVP) at 60 and 150 days showed the right kidneys in a more cephalad position, and showed pelvicaliceal dilatations and that the ureteral kinks seemed to be resolved. On days 15, 60, 90, and 150 of the first- and second-year follow-ups, severity of pain was 1 of 10 on the visual analog scale.

Conclusion: We believe that the technique of transperitoneal laparoscopic nephropexy with nonabsorbable polymer clips on patients with symptomatic mobile kidney is safe and easy to perform and shows successful long-term results.

Key Words: Kidney, Laparoscopy, Mobile kidney, Nephropexy, Polymer clips.

INTRODUCTION

Nephropexy, the surgical treatment for mobile kidney (nephroptosis), was formerly performed by open procedure. Laparoscopic nephropexy was first described by Urban et al in 1993.¹ Surgical objective of nephropexy was to immobilize the kidney in a more cephalad position and prevent the associated obstruction of the renal pelvis, as well as to reduce the tension on the ureter and renal pedicle. Fixation procedures are generally performed in 3 different techniques. One of them is using the renal capsula for fixation of kidney. The second is using fascial flaps or muscle bonds for the fixation. The third one is the fixation of kidney with exogenous materials such as clips and tapes.² In laparoscopic techniques, the capsule of the kidney is sutured to the fascia of the psoas or quadratus lumborum muscles in most cases. Here we present our clinical series with 7 patients who were successfully treated via a transperitoneal laparoscopic approach in which Gerota's fascia and the perirenal fat tissue were attached to the transversus abdominis fascia with nonabsorbable polymer clips (Hem-O-Lok clips, Pilling Weck, Teleflex Medical, Markham, ON, Canada).

MATERIALS AND METHODS

Patients

Between 2006 and 2009, 7 women, ranging in age from 34 to 47 years old (mean age 39.2 years), were referred to our department for surgical repair of a mobile kidney. All had right-sided chronic pain refractory to analgesics, and preoperative workup with intravenous pyelography and CT scan showed a mobile right kidney. Preoperative pain scores using the visual analog scale are shown in Table 1. None of the patients had any history of urinary tract infections, hypertension, or renal calculi. The 7 patients underwent a transperitoneal laparoscopic nephropexy procedure with nonabsorbable polymer clips by fixation of the perirenal tissue to the transversus abdominis fascia and the triangular ligament.

Surgical Technique

A transperitoneal laparoscopic technique, as described by Lee and Clayman, was used.³ The colon was initially

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Table 1.
Preoperative and Postoperative Pain Scores and the Operation Times of All Patients

Patient No.	Age, y	Preoperative VAS	Postoperative VAS	Blood Loss, mL	Operation Time, min
1	34	10/10	1/10	<20	15
2	34	7/10	1/10	<20	25
3	39	9/10	1/10	<20	22
4	40	8/10	1/10	<20	25
5	40	9/10	1/10	<20	20
6	41	8/10	1/10	<20	20
7	47	8/10	1/10	<20	18

VAS =Visual analog score.



Figure 1. A, Preoperative intravenous pyelography. The dilatation in the collecting system and the link in the ureter. B, Postoperative films taken at day 60 after surgery. C, postoperative films taken at day 210 after surgery.

reflected medially. The posterior peritoneum was incised and was dissected from Gerota's fascia at the upper pole of the kidney. The Gerota's fascia was then attached to the transversus abdominis fascia and the incised lateral edge of the infrahepatic triangular ligament with nonabsorbable polymer clips (Hem-O-Lok clips, Pilling Weck, Teleflex Medical).

RESULTS

Estimated blood loss was <20 mL in each patient. Mean operation time was 20.7 minutes. None of the patients needed postoperative analgesic medication and they were discharged from the hospital 24 hours after surgery with instructions for bed rest. The patients returned for postoperative follow-up visits on postoperative days 7, 15, 60, 90, and 210. All patients reported improved symptoms after laparoscopic nephropexy. One of the patient's follow-up intravenous pyelogram (IVP) on day 60 is shown in Figure 1B and day 210 is shown in Figure 1C. The

follow-up IVP showed that the right kidney was more cephalad relative to its preoperative position by the thickness of 1 vertebra (Figure 1). The dilatation in the collecting system and the kink in the ureter, both visible in the preoperative films, had resolved (Figure 2). On days 15, 60, 90, and 210, the patients described their pain as 1 of 10 on the visual analog scale. No complications were observed in 2 years of follow-up. Patients were asked about the operative outcomes. All patients were satisfied at the 2-year follow-up period. Preoperative and postoperative pain scores and the operation time are given in Table 1.

DISCUSSION

Mobile kidney, also known as nephroptosis, is defined as downward displacement of the kidney by 5 cm when the patient's position is changed from supine to erect.⁴ The disorder is often present in young and slim women, and the right kidney is most often affected.²⁻⁵ It may be asymp-

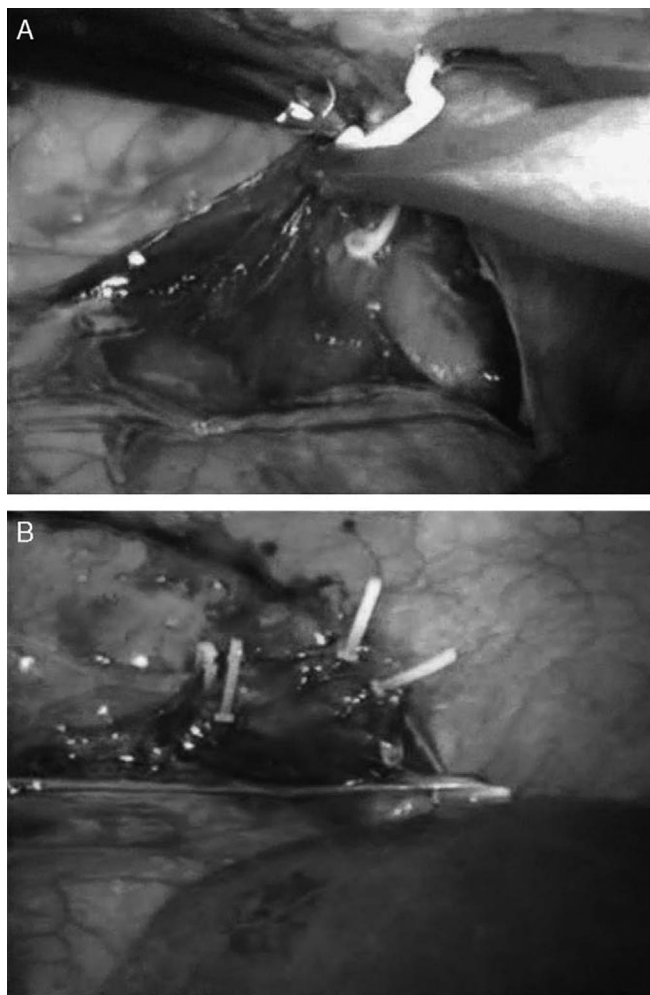


Figure 2. A, Attachment procedure with an polymer clips applicator. B, Gerota's fascia and the perirenal fat tissue was completely attached to the transversus abdominis fascia and triangular ligament with polymer clips.

tomatic or associated with long periods of standing and recurrent urinary tract infections.⁴ Many operative techniques and modifications of nephropexy have been described, but no definitive procedure exists, and urologists generally have been hesitant to treat mobile kidney because the available treatments, even though most of them are laparoscopic techniques, are invasive, although the symptoms are not always severe.^{6,7} For patients with mobile kidney, the decision algorithm for treatment involves two general questions: whether surgery should be performed, and, if so, by what method. Surgery is recommended generally for patients who have both symptoms and objective findings because radiologically visible mobile kidney is more common than the symptomatic form of the disease.⁸ Surgical

methods used for treating mobile kidney have ranged from open surgery⁹ to laparoscopy^{6,8} to percutaneous treatment.^{10,11} Open surgery is generally not preferred due to its invasiveness. The percutaneous method offers some advantages, such as short operation time and the ability to be performed using local anesthesia with ultrasonography or fluoroscopy. However, its disadvantages include the lack of visualization of nearby structures that could be damaged during the procedure, as well as a longer hospital stay and postoperative rest period compared with laparoscopy.¹⁰ Laparoscopic nephropexy was first reported by Urban et al in 1993 and is likely to remain the mainstay of surgical intervention in the future. It can be performed with either a transperitoneal or retroperitoneal approach. Most authors have used the transperitoneal approach because it provides a larger working space and avoids the lateral position of the patient used in the retroperitoneal approach, in which a mobile kidney can fall forward and become less accessible. Three main surgical techniques for nephropexy have been used with success, and these are fixation using the renal capsule, fixation with fascial flaps or muscle bands, and fixation with foreign material.² In the patient reported here, Gerota's fascia and perirenal fat tissue were attached to the incised edge of the infrahepatic triangular ligament and to the fascia of the transversus abdominis muscle with nonabsorbable polymer clips (Hem-O-Lok clips, Pilling Weck, Teleflex Medical) (Figure 2). To the best of our knowledge, this technique has not been used previously. In the report by Rassweiler et al¹² that described their experience with 200 cases of retroperitoneoscopic surgery, nephropexy was classified as technically difficult. The advantage of the technique reported here is that it is easier and quicker than other techniques. Long-term results were successful. At the 2-year follow-up, our patients had not experienced any recurrence of symptoms, but this possibility of success should be explored in larger series

CONCLUSION

We believe that the technique of transperitoneal laparoscopic nephropexy with nonabsorbable polymer clips on patients with symptomatic mobile kidney is easy to perform and shows successful long-term results.

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